

PLEASE AMEND THE CLAIMS AS FOLLOWS:

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20 (TWICE AMENDED) An upper level metal interconnect structure on a semiconductor substrate, comprised of a metal structure located on a smooth top surface of an underlying insulator layer, and an attached metal ring structure in turn comprised of metal spacers, comprising:

5 a lower level metal interconnect structure;
said insulator layer located on said lower level metal interconnect structure;
a via hole in said insulator layer exposing a portion of a top surface of said lower level metal interconnect structure;
a recessed metal plug structure located in a bottom portion of said via hole, with
10 said recessed metal plug structure overlying and contacting the portion of said lower level metal interconnect structure, exposed in said via hole; and
said upper level metal interconnect structure, comprised of said metal structure and comprised of attached said metal ring structure, wherein said metal structure is located only on one side of via hole on a portion of a top surface of said insulator layer,
15 and also located on an edge of underlying, said recessed metal plug structure, and wherein said metal ring structure, attached to said metal structure, is located overlying, and contacting only portions of a top surface of said recessed metal plug structure, with said metal ring structure comprised of metal spacers on the sides of a top portion of said via hole with a space located between said metal spacers exposing a portion of a
20 top surface of said recessed metal plug structure.

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21. (TWICE AMENDED) The upper level metal interconnect structure of claim 20, wherein said lower level metal interconnect structure is comprised of a composite metal structure, featuring an aluminum, or an aluminum based layer, at a thickness between about 2000 to 20000 Angstroms, with an underlying titanium nitride layer, at a thickness between about 100 to 1500 Angstroms, and an overlying titanium nitride layer, at a thickness between about 100 to 1500 Angstroms.
22. (TWICE AMENDED) The upper level metal interconnect structure of claim 20, wherein said via hole is comprised with a diameter between about 0.10 to 1.0 um.
23. (TWICE AMENDED) The upper level metal interconnect structure of claim 20, wherein said recessed metal plug structure, is comprised of tungsten, with the height of said recessed metal plug structure, located in said bottom portion of said via hole, between about 3000 to 20000 Angstroms.
24. (TWICE AMENDED) The upper level metal interconnect structure of claim 20, wherein said metal ring structure, attached to said metal interconnect structure of said upper level metal interconnect structure, is comprised of aluminum, or aluminum - copper spacers, located on the sides of said top portion of said via hole.